

## Comparative Evaluation of Alteration in Serum Lipid Profile in Patients with Leukoplakia

Shivendra Chaudhary<sup>1</sup> Ritika Agarwal<sup>2\*</sup> Ravi Anjan<sup>3</sup> Medha<sup>4</sup>

<sup>1</sup>Professor and Head, Department of Dentistry, Patna Medical College, Patna, Bihar, India.

<sup>2</sup>Senior Resident, Department of Dentistry, Patna Medical College, Patna, Bihar, India.

<sup>3</sup>Dental Medical Officer, ECHS, Daltonganj, Jharkhand, India.

<sup>4</sup>PG Student, Department of Pedodontics, Mithali Minority Dental College, Darbhanga, Bihar, India.

### ABSTRACT

**Background:** Leukoplakia is a potentially malignant disorder (PMD) and plays a vital role in pathogenesis of oral squamous cell carcinoma. The present study was conducted to assess alteration in serum lipid profile in patients with leukoplakia.

**Materials & Methods:** 35 cases of oral leukoplakia of both genders (Group I). Equal number of healthy subjects were also included (Group II). Lipid profile assay of the specific parameters like total cholesterol, HDL, LDL, VLDL, triglycerides were done.

**Results:** Group I had 28 males and 7 females and group II had 29 males and 6 females. Common site was gingiva in 8%, palate in 5%, tongue in 12%, buccal mucosa in 45% and lip commissure in 30%. The mean triglyceride in group I was 80.2 mg/dl and in group II was 94.6 mg/dl, total cholesterol was 124.6 mg/dl and in group I and 156.2 mg/dl, HDL was 32.4 mg/dl and 46.2 mg/dl in group I and II respectively, LDL was 106.2 mg/dl and 96.4 mg/dl in group I and II respectively, VLDL was 20.4 mg/dl in group I and 18.2 mg/dl in group II. The difference was significant ( $P < 0.05$ ).

**Conclusion:** Alterations in the plasma lipid profile patterns were significant. There was higher level of lipid in leukoplakia than healthy subjects.

**Keywords:** Lipid profile, Leukoplakia, Potentially malignant disorder.

### INTRODUCTION

Leukoplakia is a potentially malignant disorder (PMD) and plays a vital role in pathogenesis of oral squamous cell carcinoma (OSCC) in the oral cavity. The risk of neoplastic transformation varies from 0.3 to 25%.<sup>1</sup> The dysplastic changes in leukoplakia increase incidence of malignancy over 30%. Differentiation, proliferation and apoptosis are fundamental aspects of tumor biology. Constant growth of precancer and cancer need a positive balance between cell apoptosis and malignant cell proliferation.<sup>2</sup>

Lipids are the major cell membrane components, which are essential for various biological functions like maintaining cell integrity, cell growth, and division of normal and malignant cells. Changes in the lipid profiles have been seen in various diseased conditions including the oral cancer.<sup>3</sup> Numerous studies have shown an altered lipid profile in various cancers including head and neck cancers. An inverse relationship between plasma lipid profiles have been seen in oral cancer and pre-cancerous subjects. The lower plasma lipid status

Received: Jan. 3, 2020: Accepted: Mar. 2, 2021

\*Correspondence Dr. Ritika Agarwal.

Department of Dentistry, Patna Medical College, Patna, Bihar, India.

Email: drritikaagarwal@gmail.com

may be a useful indicator for initial changes occurring in neo-plastic cells.<sup>4</sup>

Alterations in blood cholesterol levels in diagnosing and treating various diseases has been studied by several workers. Researchers have reported association of serum/plasma lipids and lipoproteins with different cancers, but only few studies are reported association with head and neck cancers.<sup>5</sup> The present study was conducted to assess alteration in serum lipid profile in patients with leukoplakia.

## MATERIALS & METHODS

The present study comprised of 35 cases of oral leukoplakia of both genders (Group I). Equal number of healthy subjects were also included (Group II). All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. The diagnosis was made based on history, clinical features and histopathological examination. 5ml of blood was collected from each subject and is allowed to clot and then the serum is separated by centrifugation. Lipid profile assay of the specific parameters like total cholesterol, HDL, LDL, VLDL, triglycerides were done. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

## RESULTS

Table I: Distribution of patients.

Groups	Group I	Group II
Status	Oral leukoplakia	Healthy
M:F	28:7	29:6

Table I shows that group I had 28 males and 7 females and group II had 29 males and 6 females.

Table II: Site of leukoplakia.

Site	Percentage	P value
Gingiva	8%	0.01
Palate	5%	
Tongue	12%	
Buccal mucosa	45%	
Lip commissure	30%	

Table II, graph I shows that common site was gingiva in 8%, palate in 5%, tongue in 12%, buccal mucosa

Graph I: Site of leukoplakia.

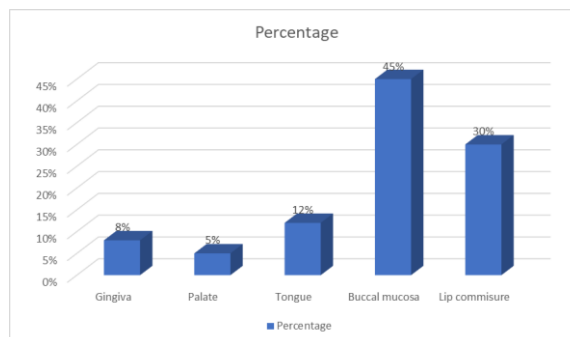
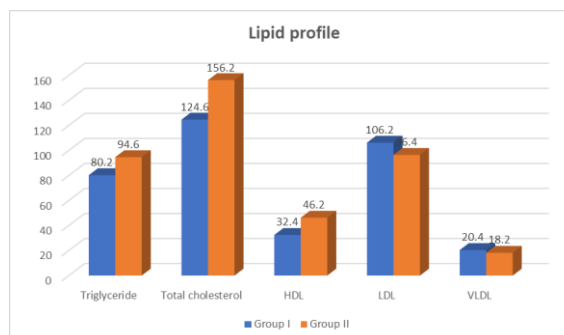


Table III: Assessment of lipid profile in both groups.

Lipid profile	Group I	Group II	P value
Triglyceride	80.2	94.6	0.02
Total cholesterol	124.6	156.2	0.04
HDL	32.4	46.2	0.05
LDL	106.2	96.4	0.01
VLDL	20.4	18.2	0.01

Table II, graph II shows that mean triglyceride in group I was 80.2 mg/dl and in group II was 94.6 mg/dl, total cholesterol was 124.6 mg/dl and in group I and 156.2 mg/dl, HDL was 32.4 mg/dl and 46.2 mg/dl in group I and II respectively, LDL was 106.2 mg/dl and 96.4 mg/dl in group I and II respectively, VLDL was 20.4 mg/dl in group I and 18.2 mg/dl in group II. The difference was significant ( $P < 0.05$ ).

Graph II: Assessment of lipid profile in both groups.



## DISCUSSION

Leukoplakia is the most common potentially malignant disorder of the oral mucosa. The term is derived from the Greek word Leuko meaning White and plax meaning plaque.<sup>6</sup> Bazin first described it, but Schwimmer in 1877 differentiated it from psoriasis and termed it as Leukoplakia.<sup>7</sup> Axell et al in 1984 defined leukoplakia as "whitish patch or plaque which cannot be characterized clinically or pathologically as any other disease and is not associated with any physical or chemical causative agent except the use of tobacco."

The oral cavity is the site of the body where contact with exogenous material, micro-organisms and harmful agents are more intense. The oral mucosa functions as a mechanical and immunological barrier. Protective mechanisms are noted in the form of increased capacity for epithelial regeneration and increased keratinisation.<sup>8</sup> These epithelial changes are reactive and reversible but progressive loss of normal control mechanisms leads to pre-cancerous states and oral cancer. The concept of a two- step process of cancer development in the oral mucosa, i.e, the initial presence of a precursor subsequently developing into cancer, is well established. Oral leukoplakia is the best-known precursor lesion.<sup>9</sup> The present study was conducted to assess alteration in serum lipid profile in patients with leukoplakia.

In present study, group I had 28 males and 7 females and group II had 29 males and 6 females. Vijay et al<sup>10</sup> evaluated the alteration in serum lipid profile in patients with oral leukoplakia. The study was conducted on 20 oral leukoplakia cases and 20 controls. Lipid profile included analysis of total cholesterol (TC), low density lipoprotein cholesterol (LDL), high cholesterol (HDL), very low- density lipoprotein cholesterol (VLDL), triglycerides (TG) and ratio of high- and low-density lipoprotein cholesterol. Lipid profiles were measured using the standard reagents. TG, LDL & VLDL were more in males in both groups. TC and HDL levels were highest in females, but were non- significant. A significantly reduced serum level of HDL, VLDL, TGL, TC and LDL were also reduced in the oral leukoplakia group. TGL were highest in patients who had mild dysplasia and lowest TC, while, moderate dysplasia cases had highest TC and lowest TG, LDL, VLDL, HDL.

We found that common site was gingiva in 8%, palate in 5%, tongue in 12%, buccal mucosa in 45% and lip commissure in 30%. Mahesh et al<sup>11</sup> in their study 30 patients were included in the study (15 patients with oral leukoplakia (histo-pathologically proven) and 15 patients for comparison of results as controls). Patients with cardiovascular diseases, uncontrolled diabetes mellitus, acute hepatitis and nephrosis were excluded from the sample and lipid profile assay was done by fully automated biochemistry analyser (EM-360). The plasma lipid levels were estimated in between the two groups by arithmetic mean along with standard deviation. The lipid parameters included were Total cholesterol, HDL, LDL, VLDL, Triglycerides. The lipid parameters of the patients in between the two groups were compared and analysed. In this study TC, HDL, LDL, Triglyceride level analysis showed slightly lower levels in oral leukoplakia patients than that of the controls. Higher VLDL levels were observed in leukoplakia than the control group.

We observed that mean triglyceride in group I was 80.2 mg/dl and in group II was 94.6 mg/dl, total cholesterol was 124.6 mg/dl and in group I and 156.2 mg/dl, HDL was 32.4 mg/dl and 46.2 mg/dl in group I and II respectively, LDL was 106.2 mg/dl and 96.4 mg/dl in group I and II respectively, VLDL was 20.4 mg/dl in group I and 18.2 mg/dl in group II. Kumar et al<sup>12</sup> in their study 90 patients, 30 with oral cancer, 30 with leukoplakia and 30 age and sex matched normal controls. Serum lipid profile was estimated in all 90 patients by a semi-autoanalyzer. In comparison to controls, oral cancer patients had significantly lower levels of total cholesterol (TC), high density lipoproteins (HDL) and very low- density lipoproteins (VLDL). TC, HDL, and VLDL were also lower in leukoplakia group compared to that of controls, but the difference was insignificant.

The limitation of the study is small sample size.

## CONCLUSION

Authors found that alterations in the plasma lipid profile patterns were significant. There was higher level of lipid in leukoplakia than healthy subjects.

## CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

## REFERENCES

1. Allampallam K, Dutt D, Nair C, Shetty V, Mundle S, Lisak L, et al. The clinical and biologic significance of abnormal lipid profiles in patients with myelodysplastic syndromes. *J Hematother Stem. Cell Res* 2000;9:247-55.
2. Gerber M, Richardson S, DePaulet PC, Pujol H, DePaulet AC. Relationship between vitamin E and polyunsaturated fatty acids in breast cancer: Nutritional and metabolic aspects. *Cancer* 1989;64:2347-53.
3. Gerber M, Cavallo F, Marubini E, Richardson S, Barbieri A, Capitelli E, et al. Liposoluble vitamins and lipid parameters in breast cancer. A joint study in Northern Italy and Southern France *Int J Cancer* 1988;42:489-94.
4. R Rajendran. Oral leukoplakia (Leukokeratosis): Compilation of facts and figures. *J Oral MaxillofacPathol.* 2004;8(2):58-68.
5. CR Rein, JJ Goodman. Leukoplakia buccalis. *CA Cancer J Clin.* 1954;4(5):164-166.
6. Yh Yang, YC Lien, PS Ho, CH Chen, JS Chang, TC Cheng, et al. The effects of chewing areca betel quid with and without cigarette smoking on oral sub-mucous fibrosis and oral mucosal lesions. *Oral Diseases.* 2005;11:88-94.
7. Proia NK, Paszkiewicz GM, Maureen A. Smoking and smokeless tobacco associated human buccal cell mutations and their association with oral cancer — A review. *Cancer Epidemiol Biomarkers Prev* 2006;15(6):1061-77.
8. Greenberg M, Click M, Ship JA. *Burkets Oral Medicine, Diagnosis and treatment*, 10th ed. New Delhi, India:Elsevier; 2003. p.194-234.
9. Mishra M, Mohanty J, Sujatha S, Bharatha S. Epidemiological and clinic-pathological study of oral leukoplakia. *Indian J Dermatol Leprol* 2005;71(3):161-5.
10. Vijay P, Pardhe N, Chandra S, Gupta S, Sharma S, Singh P. Serum lipid profile analysis in patients with oral leukoplakia. *Advance Research Journal of Multidisciplinary Discoveries.* 2019; 33(5): 21-24.
11. Mahesh N, Rahamthullah SA, Naidu GM, Rajesh A, Babu PR, Reddy JM. Alterations of Plasma lipid profile patterns in oral leukoplakia. *J Int Oral Health* 2014;6(1):78-84.
12. Kumar, G. K., & Abidullah, M. Comparative Evaluation of Serum Lipid Profile in Leukoplakia and oral Cancer – A Tertiary Referral Hospital Based Study. *Asian Journal of Medical Research* 2018;7(2):01-04.